Volume 9, No.4, July – August 2020
International Journal of Advanced Trends in Computer Science and Engineering
Available Online at http://www.warse.org/IJATCSE/static/pdf/file/ijatcse203942020.pdf
https://doi.org/10.30534/ijatcse/2020/203942020

Collaborative Tourist Information Sharing System

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ABSTRACT

The task of the planning phase prior to travelling is always undervalued as an effort that takes time to create and manage. Finding locations that are good to visit is hard as people do not always know whether what they are reading is true or whether it is forged to give the impression that it is good when it is actually not. Research regarding the process of searching for information about locations does not receive considerate attention from researchers, resulting in limited studies about the topic in the literature. Therefore, this study aimed at bridging the gap by designing and developing a web app (application) for sharing information of interesting locations. The evolutionary prototyping methodology was adopted in designing and developing the prototype. The prototype named Collaborative Information Sharing System (CISS) was developed based on the gathered requirements. The results of the evaluation suggested that CISS is indeed useful and easy to use. The study contributes towards the understanding of the system requirements and user interface of a web application for sharing information of interesting locations.

Key words: Travelling planning, tourism, information sharing, collaborative system, web-based application.

1. INTRODUCTION

Research on travelling are plenty, from what it does to the mind and how it affects human life in general. Nevertheless, research regarding the process of searching for locations to travel to has not received much attention. People often regard the process as something easy to be done by simply going to the Internet and looking for places that people say are good. Although this process is better and easier than the way it was done back then, how will people know if the words people say on the Internet are honest and not forged to give off the impression that it is good? Due to this issue, there is a need for a platform that allows tourists to share their honest opinion and allow them to explore locations that they may have not even heard.

The Internet is one of the most important tools for the human being. The Internet has been a part of human life for quite a while now, for instance a web application would be an immensely useful tool for planning purposes [1]. Prior studies have shown that the Internet is also an important source for travel planning [2]. Before travelling takes place, one must first plan their travels. It is an essential step before travelling and having fun. Planning could help tourists minimise their spending, thus saving money for other expenses and probably for the next travelling plan. They also can share their experiences, the locations they visited and their opinions. These information will become the input to the others when the plan their travels as well.

Therefore, this paper attempts to bridge the gap by investigating the potential of the Internet as a platform to share opinions of visited places. This study aims to design and develop a web application for sharing information of interesting places. As a result, Collaborative Information Sharing System (CISS), a prototype of a web application for sharing information of locations is proposed and developed.

Collaborative system is a system where multiple users engage in a shared activity, usually from remote locations. There are many examples of a collaborative system, from social media to online document editing, where users can even leave reviews for items or locations online.

This study contributes towards an understanding of the system requirements for such applications that could be a reference model for developers and researchers to continue improving the process of sharing honest information. The next section describes the background and related studies. The following section after that depicts the design and development of CISS. The subsequent section explains the usability evaluation of CISS. The last section in this paper concludes the study and lists the future works.

2. RELATED APPLICATIONS

As studies have shown, travelling is an activity that interests a wide variety of people [3,4,5,6]. Typically, these people use their prior knowledge on interesting places to search for more information on the Internet [7,8]. Currently, there are several services that allow tourists to find information on the locations they wish to visit [3]. However, those services are limiting them on only one category of information such as Agoda for hotels and Yelp for restaurants. Table 1 shows the description of the websites.

Table 1: Examples of available apps

App	Description
Agoda	One of the world's fastest growing online travel booking platforms. From its beginning as an e-commerce start-up based in Singapore in 2005, Agoda has grown to offer a global network of 2 million properties in more than 200 countries and territories worldwide
Yelp	Founded in 2004 to help people find great local businesses like restaurants. Has a monthly average of 35 million unique visitors who visited Yelp. Users have written more than 284 million reviews by the first quarter of 2019

These services are great, and they serve their purpose as travelling recommendation and booking sites. Nevertheless, there are still no applications that allow users to search and look for general locations. Each time users want to review or look for another category of locations, they would have to go to another app, or find another one that would fulfil their needs. Consequently, there is a need for research and development of an application that allows the information sharing of many categories of locations in one app. The study presented in this paper aims at designing and developing a web application for sharing of information on various categories.

3. METHODOLOGY

The study was conducted following the evolutionary prototyping method. Evolutionary prototyping is a continuous process for adapting an application system to rapidly changing organisational constraints. Software development is not seen as a self-contained project; instead, it is seen as a process continuously accompanying the application. This was outlined as the Software Development Life Cycle (SDLC) which consists of a detailed plan and steps of the software development [9]. Since short development cycles are aimed at, it is good to eliminate any differences between prototypes and application systems by developing a pilot system. Evolutionary prototyping is related to the principles of system development. The difference is that each iteration is shown to stakeholders for feedback. The flow of the phases is illustrated in Figure 1.

The requirement gathering phase involved gathering and analysing all the information needed to create the system. From there, the information received would be analysed to identify the requirements of the system. Computer-Aided Software Engineering (CASE) tools were used to help ensure the system's requirements were complete and consistent by displaying them through Unified Modelling Language (UML) diagrams, which would be developed using StarUML.

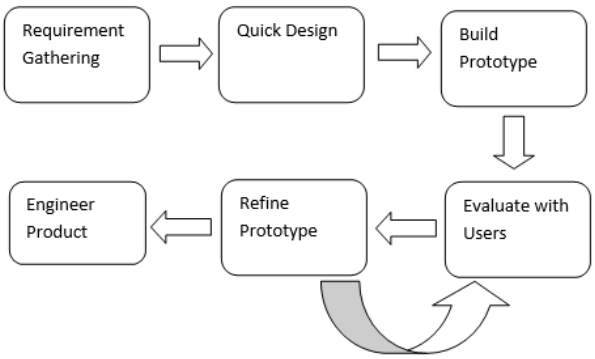

Figure 1: Evolutionary prototyping phases

The quick design phase included designing the system, the look and feel, and how each component interacted with each other, which would be represented in the form of a sequence diagram, activity diagram, and class diagram. Like in the requirement gathering phase, CASE tools were used again to develop these diagrams and they would also be developed in StarUML.

After the design was completed, the first rendition of the prototype was built. The prototype was developed using Hypertext Pre-processor (PHP) script and MySQL database.

The system was then evaluated and opinions on what could be added to the system were gathered. Any required improvements were then refined and implemented into the prototype. When the prototype was finished, it was evaluated again. This continued until the prototype fulfilled all the requirements. Lastly, when all requirements were fulfilled, the system is finished and ready to use.

4. DESIGN AND DEVELOPMENT OF THE PROTOTYPE

The requirement gathering process was carried out by analysing documents and existing apps on the Internet. Table 2 lists the significant requirements produced from the requirement gathering process.

The requirements presented in Table 2 were translated into the computer system's functionality. The next process involved visualising and modelling the requirements of the app using appropriate modelling methods and tools. The Unified Modelling Language (UML) was used to visualise and model the requirements. The models used in this work were use case diagrams and class diagrams that represented the components of the web app. The diagrams were drawn using StarUML. Figure 2 shows the use case diagram along with the communications between the use cases and actors for the app. The main use cases were register, login, logout, post review, search, view location, add location, add category, manage information, manage system, and produce infographic statistic.

Table 2: List of requirements

No.	Requirement Description	Priority
A	**Register**	
1.	Tourist shall be able to create an account.	M
2.	System would display error message if the password that the user entered does not match with the initial entry.	M
B	**Login**	
3.	User shall be able to login using their email address.	M
4.	User shall be able to change their password if they forgot their password.	M
C	**Post reviews**	
5.	User shall be able to post text reviews.	M
6.	User shall be able to include pictures in their reviews.	M
7.	User shall be able to rate the location.	M
D	**Search**	
8.	User shall be able to search for locations.	M
E	**View Location**	
9.	User shall be able to view a list of locations.	M
F	**Add Location**	
10.	User shall be able to add relevant locations that the system does not yet have.	M
11.	User shall be able to update the location's information.	M
G	**Add Category**	
12.	User shall be able to add relevant categories of places that the system does not yet have.	M
13.	User shall be able to update category information.	M
H	**Manage Information**	
14.	User shall be able to add their information.	M
15.	User shall be able to delete their information	M
16.	User shall be able to update their information	M
I	**Manage System**	
17.	Admin shall be able to add categories.	M
18.	Admin shall be able to delete locations (pre-existing or user input).	M
19.	Admin shall be able to update location categories (pre-existing or user input).	M
20.	Admin shall be able to delete tourist.	M
J	**Produce Infographic Statistic**	
21.	Admin shall be able to produce an infographic statistic report of user's reviews.	M
K	**Logout**	
22.	User shall be able to logout.	M

M = moderate

Figure 2: The use case diagram

The class diagram illustrates the structural components of the app as shown in Figure 3. In this figure, six main classes were identified. The interactions between classes were shown in the diagram.

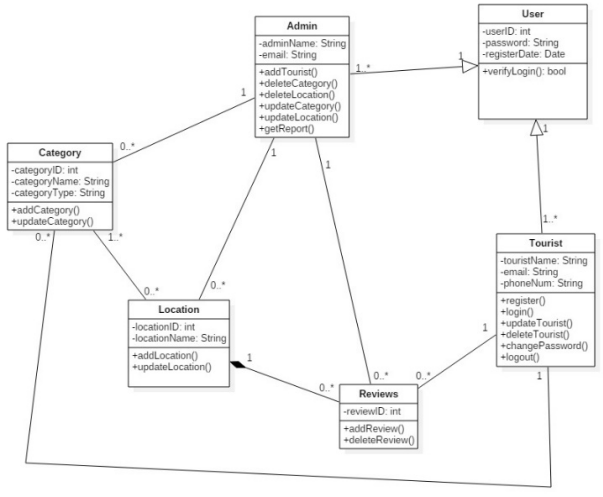

Figure 3: The class diagram

5. PROTOTYPE

A prototype of Collaborative Information Sharing System called CISS was developed. It implemented the requirements explained in the previous section. Prototyping is a standard way of demonstrating requirements so that further comments and suggestions could be obtained from the users based on their experience in interacting with the prototype. Notepad++ was used as the main tool for developing this prototype. Furthermore, phpMyAdmin platform was utilised to facilitate functions like login, and the database to store data. The screenshots in Figures 4–6 illustrate the interfaces of the main functions.

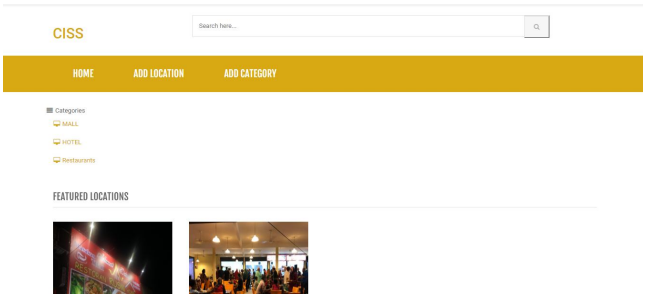

Figure 4: Main menu of CISS

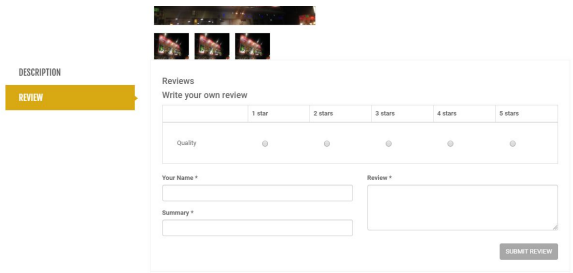

Figure 5: Leaving a review on a location in CISS

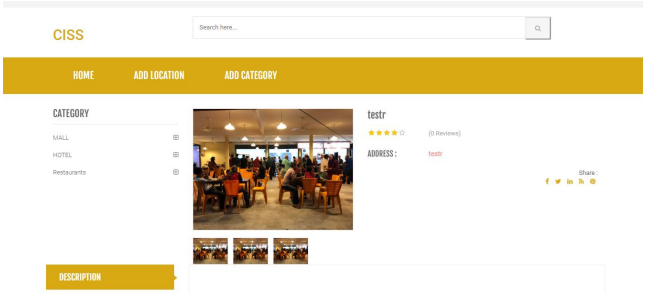

Figure 6: Location details in CISS

6. EVALUATION

6.1 Evaluation Setting

A usability evaluation was conducted on 25 respondents consisting of students from Universiti Utara Malaysia. The respondents were asked to use the prototype and answer the questionnaire. The questionnaire was adapted from [10], which comprised 10 compulsory questions along with one optional question. Most questions asked the respondents to give their opinion about the CISS app in a scale of 1 to 5, where 1 represents 'extremely unsatisfied' or 'extremely unlikely', and 5 represents 'extremely satisfied' or 'extremely likely'. The respondents performed the following procedure for the evaluation: (1) interact with the CISS app as stated in the experiment procedure, and (2) answer the questionnaire.

6.2 Usability of CISS

An analysis was conducted on the respondents' responses in the questionnaire. It measured the respondents' perception towards CISS usefulness and ease of use. It also evaluated the respondents' satisfaction regarding the collaborative aspect of CISS. Table 3 shows the frequency and average responses.

Table 3: Respondents' feedback

Questionnaire topic	1	2	3	4	5	Average
Reliability	0	0	1	8	16	4.6
Security	2	11	3	7	2	2.8
Ease of use	0	0	0	7	18	4.72
Look and feel	6	12	6	1	0	2.08
Satisfaction with account set up	0	0	0	13	12	4.48
Collaborative aspect	0	2	5	16	2	3.8
Recommend	0	0	10	15	0	3.6
Overall	0	0	13	12	0	3.48

Outcomes of the evaluation suggested that while CISS was reliable and easy to use, there were still multiple aspects where it could be improved. To begin with, the security of the system could be improved by adding a two-step verification along with a better encryption than MD5 (which was what the system was using). SHA-256 Cryptographic Hash Algorithm is known to be better than MD5 [11].

Another aspect where the system could be improved is the interface. The interface of CISS left much to be desired for a web app. A better colour palette along with a more attractive design that follows the web engineering practices would be highly beneficial [12].

The other aspect where CISS could be improved is its collaborative aspect. While this is the only application that allows users to add different locations to the database, it still lacks a function that allows users to better interact with each other while accessing the app. A community tab where users could ask for recommendations would be useful.

7. CONCLUSION

In the future, the plan is to extend the functionality of CISS by providing more support for collaboration/communication with other users. Adding a community tab where users can interact with each other through forums would help boost its collaborative aspect greatly. Furthermore, a way for users to chat among each other while getting real-time answers from people who have been to many places in the location would support it even more. Making the system available for a mobile platform would also be a useful alternative for tourists or travellers as demonstrated by the Grab mobile app [13].

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